Please amend the claims to read as follows:

Listing of Claims

Claims 1-9 (Cancelled).

10. (New) A base station apparatus that performs radio communication with a plurality of mobile station apparatuses concurrently, the base station apparatus comprising:

a plurality of antennas provided in a greater number than the plurality of mobile station apparatuses;

a receiver that receives a plurality of signals from the plurality of mobile station apparatuses via the plurality of antennas;

an estimator that estimates channel estimation values between the plurality of mobile station apparatuses and the plurality of antennas using the plurality of signals;

a converter that performs linear conversion of a plurality of transmission signals using the channel estimation values; and

a transmitter that transmits the plurality of transmission signals subjected to linear conversion to the plurality of mobile station apparatuses via the plurality of antennas, wherein:

the converter performs linear conversion of the plurality of

transmission signals in accordance with the formula:

$$|Sig_{out}|_{Nx1} = |x|_{NxM} \cdot |Sig_{in}|_{Nx1}$$

where:

N and M are each an integer of 2 or greater than 2;

$|Sig_{out}|_{Nx1}$ is a matrix of the plurality of transmission

signals subjected to linear conversion in the converter;

$|x|_{NxM}$ is a matrix of coefficients determined from the

channel estimation values estimated in the estimator; and

$|Sig_{in}|_{Nx1}$ is a matrix of the plurality of transmission

signals before linear conversion in the converter.

11.   (New)   The base station apparatus of claim 10, wherein,

in the formula, N is the number of the plurality of mobile

station apparatuses and M is the number of the plurality of

antennas.

12.   (New)   The base station apparatus of claim 10, wherein

the converter performs linear conversion of the plurality of

transmission signals so that interference is cancelled from the

plurality of transmission signals upon reception at the plurality

of mobile station apparatuses.

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13. (New) The base station apparatus of claim 10, wherein the convertor performs linear conversion of the plurality of transmission signals so that influence of delay waves is removed from the plurality of transmission signals upon reception at the plurality of mobile station apparatuses.

14. (New) The base station apparatus of claim 10, further comprising a coefficient calculator that calculates the coefficients used in the converter through inverse matrix operation using the channel estimation values estimated in the estimator.

15. (New) The base station apparatus of claim 14, further comprising a selector that selects the same number of antennas as the plurality of mobile station apparatuses from the plurality of antennas for use in the inverse matrix operation.

16. (New) The base station apparatus of claim 10, further comprising a trainer that determines the coefficients used in the converter through training processing using the channel estimation values estimated in the estimator.

17.   (New)   The base station apparatus of claim 16, further comprising a generator that generates noise having an equivalent level as an anticipated level of noise at the plurality of mobile station apparatuses, wherein the trainer incorporates the noise generated in the generator in the training processing.

18.   (New)   The base station apparatus of claim 16, further comprising a selector that selects the same number of antennas as the plurality of mobile station apparatuses from the plurality of antennas for use in the training processing.